The Australian Accountant

Published Monthly for the Commonwealth Institute of Accountants and The Australasian Institute of Cost Accountants

Vol. XIII, No. 7 JULY 15, 1943 Subscription: Per annum, 12/6 Single copies, 1/6

Depreciation under the Sinking Fund System

By Edgar Vivian Arentz, a.c.a.a., etc.

In the theory of finance there are numerous speedy and convenient short-cuts to an end, and, when the student is thoroughly familiar with his work thereunder, this knowledge (that the multiplicity of functions are closely related and therefore only require some logical factor for conversion one to the other as desired) should be of inestimable value. But without such knowledge of the subject, short-cuts and other make-do formulae will only tend to cause confusion and, more serious, a pronounced parrot-like efficiency which in itself helps to carry the victim nowhere worth while.

For an example of a short-cut which obviates the necessity of our returning to first principles for the evaluation of a sinking fund to replace £1, let us consider the amount of an annuity £1 will buy and demonstrated in my article in *The Australian Accountant* of January last. For this function we took

$$\frac{1}{a\overline{|n}} = \frac{1}{2{\cdot}884} = \text{£}{\cdot}347.$$

Here, if we assumed that £1 were to be lent for a period of three years at an interest rate of 2% p.a., the person lending such amount would receive £·347 each year, in the form of principal and interest, which liquidates the debt.

Showing the procedure in the form of a ledger account, we have—

LOAN ACCOUNT

Dr. Year	Particulars	Amount £	Year	Particulars	Amount £	*Cr.*
1	To Cash	1·000	1	By Cash:		·347
	„ Interest (2%)	·020		*Capital* ·327 } £·347		
				Interest ·020 }		
				„ Balance		·673
		1·020				1·020
2	To Balance	·673	2	By Cash:		·347
	„ Interest (2%)	·014		*Capital* ·333 } £·347		
				Interest ·014 }		
				„ Balance		·340
		·687				·687
3	To Balance	·340	3	By Cash:		·347
	„ Interest (2%)	·007		*Capital* ·340 } £·347		
				Interest ·007 }		
		·347				·347

Now, what do we (the initiated) discern from the instalment £·347 under the annuity system as shown above? It is this: An instalment under the annuity provides for a fixed rate of interest on the total capital advanced over the number of years (or periods) plus sufficient which, if accumulated at compound interest at the same prevailing rate, will replace capital at the end of the years, or periods, stipulated. Therefore, if we put $\frac{1}{s\overline{\ }n|}$, for the sinking fund which will replace £1 at the end of n years, we have the relationship that

$$\frac{1}{a\overline{\ }n|} - i = \frac{1}{s\overline{\ }n|};$$

$$\frac{1}{s\overline{\ }n|} + i = \frac{1}{a\overline{\ }n|}, \text{ where } i = \text{the rate of interest.}$$

$$\therefore \frac{1}{a\overline{\ }n|} - \frac{1}{s\overline{\ }n|} = i = a\overline{\ }n|^{-1} - s\overline{\ }n|^{-1}$$

Its meaning is that the interest function (i) is the separating factor between the two movements. If then we are in possession of one, it is only a matter of adding or substracting the rate of interest to provide the other. To amplify, let us assume the lender collects 2% p.a. on £1 = £·02, and elects to establish a sinking fund at 2% p.a. to replace his £1 at the end of three years. Then

£(·347 − ·02) = £·327 = the sinking fund instalment.

Working by arithmetic, we have

	£	
Instal. at end of first year	·327	= Capital returned vide Annuity A/c.
Interest at end of second year (2%)	·006	= Capital returned vide Annuity A/c.
Instal. at end of second year ..	·327	Also note £(·006 + ·014) = 2% on £1.
Total P. and I. beginning of third year	·660	
Interest at end of third year ..	·013	= Capital returned vide Annuity A/c.
Instal. at end of third year	·327	Also note £(·013 + ·007) = 2% on £1.
Total P. and I. end of third year	1·000	

Thus we observe capital returned as appearing in the annuity from year to year equals sinking fund instalment plus a year's interest as earned by such fund in that particular year. Moreover, the interest shown in respect of both functions added just makes the 2% as arranged. In short, the lender makes 2% p.a. no matter which way. However specially useful these exercises may be for the student of finance, the movements are merely by way of opening remarks, and, if the problem which we have in mind were to be submitted in such an unfriendly manner, we would be condoning that which has been rightly condemned by us through the years. No, my readers, do not simulate the parrot, but study your subject.

Referring to short-cuts—digressing briefly in so doing—some little time ago we were confronted with a remarkable incident. It happened thus. In the early hours of the morning (must have been about 1 a.m.) we had occasion to ask a young fellow (looked to us like an accountancy student) to complete the multiplication—

$$\cdot 9999999 \times \cdot 9999999$$

To our surprise he showed us this—after perhaps ten seconds of an interval:

$$\begin{array}{r} \cdot 99999990000000 \\ 9999999 \\ \hline \text{The product} = \cdot 99999980000001 \end{array}$$

His remarks were: "I surmised you only required correctness to seven decimals, therefore I have also completed this." He placed the following statement before us:

$$\begin{array}{r} \cdot 9999999 \\ \cdot 0000001 \\ \hline \text{The product} = \cdot 9999998. \end{array}$$

Apparently from the above he had found it very simple to multiply by 1 (or a unit) and then subtract ·0000001 of ·9999999 before arriving at the product. The whole just in mental fashion. Our reaction to such reasoning advanced led us to inquire: "Why was it you did not work in the 'new-fashioned' manner?" His reply was: "Oh, I thought it would be a good idea to dwell upon some of the methods practised by ancient computers." Yes, we can add the rejoinder that these funny old fellows did utilise their power of deduction to the full.

With some show of strictness with regard to the theory to be outlined in the following, we should feel glad if readers would refer to our previous article in *The Australian Accountant* of January last. This article was headed "Depreciation Under the Annuity System." It is not that such theory is identical with that herein, but more for the reason that much of the procedure there has a great deal in common with that put forward at present. This is so in the formation of interest tables, summing of series in geometrical progression, and, most important, in the law of approximation. Now, under the annuity system we had to envisage the present value of an annuity and finally compute the amount of an annuity 1 will purchase. In the present article, however, we deal with the amount of 1 per annum, lastly focusing our attention on the amount per annum which will replace 1. This function is the sinking fund figure. Again we find it important to notice that in considering the amount of 1 p.a., all instalments thereunder are made at the end of each period. Hence we have what is called the amount of an immediate annuity-certain. If payments are assumed at the beginning of each period involved, we would have the function under the heading of "An amount of a certain annuity-due." But this last-mentioned is another story and we shall not let it obtrude into our discussion. As to the simplicity of the theory in the case of the amount of 1 p.a., or period, if we like, take the following:

(1)	(2)	(3)	(4)
1			
·02			
1·02	1·		
·0204	·02		
1·0404	1·02	1·	
·020808	·0204	·02	
1·061208	1·0404	1·02	1·

In the above, instalments of 1 have been taken piecemeal. Column (1) shows 1 invested from the end of the first year with its accumulated interest at *2%* p.a. to the end of the fourth year. Thus its earning capacity was only $n - 1$, or $4 - 1$, $= 3$ years. It is clear then that the 1 becomes $(1{\cdot}02)^{4-1}$ $= 1{\cdot}061208$ in four years. Column (2) shows 1 invested from the end of the second year with its accumulated interest at *2%* p.a. to the end of the fourth year. Its earning capacity was only $n - 2$, or $4 - 2$, $= 2$ years. This is $(1{\cdot}02)^{4-2} = 1{\cdot}0404$ for the entire function. Interpreting the other two columns under similar theory, we then arrive at the sum $=(1{\cdot}061208 + 1{\cdot}0404 + 1{\cdot}02 + 1)$, which produces $4{\cdot}121608$ to six decimal places. This is the amount of 1 p.a. in four years at *2%* p.a. In the compiling of a table under the heading of the amount of 1 per annum in n years (we head this $s\overline{n}|$, or $\frac{(1+i)^n - 1}{i}$), all that is necessary is to extract values already shown in a table of $(1 + i)^n$. Commencinng at 1, or a unit, we have—

Amount in 1 year	=	1·	
		1·02	
„ „ 2 years	=	2·02	
		1·0404	
„ „ 3 „	=	3·0604	
		1·061208	
„ „ 4 „	=	4·121608	
		1·08243216	
„ „ 5 „	=	5·20404016	
		1·10408080	
„ „ 6 „	=	6·30812096	
.		.	
.		.	
.		.	
.		and so on to n years, or periods.	

(See my article January issue.)

Here we observe that the 1, or unit, + interest at each stage is equivalent to the values inserted to the fourth year in the first table shown. But really the problem is only one of multiplying successively by 1·02, adding the unit invested at the end of each year. This is quite patent from cursory glance at above. To deal with the finished table, see methods of laws of approximation with regard to decimals, and vide our article in January last issue. If we have the amount on the basis of 1, obviously by simple proportion any other amount may be ascertained.

For example, if £1 per annum amounts to £5·20404 in five years at 2 % p.a., what will £99 p.a. amount to? Just briefly by multiplication:

520·404
5·20404

515·19996 = £515·2 = £515/4/-.

Of course we find it easy enough to sum the separate amounts of 1 in n. Turning the respective functions the other way round for some elegance (the

unit which is invested last, and consequently earns nothing, being shown first) and adopting the foregoing figures in respect of four years, by simple arithmetic—but only providing for a correctness to three decimals—we have:

$$\begin{aligned}
4{\cdot}122 &= 1 + 1{\cdot}02 + 1{\cdot}0404 + 1{\cdot}061208 \\
4{\cdot}122 \times 1{\cdot}02 &= 1{\cdot}02 + 1{\cdot}0404 + 1{\cdot}061208 + 1{\cdot}082432 \\
4{\cdot}122 \times 1{\cdot}02 - 4{\cdot}122 &= 1{\cdot}082432 - 1 \\
4{\cdot}122 \times (1{\cdot}02 - 1) &= 1{\cdot}082432 - 1 \\
4{\cdot}122 &= \frac{1{\cdot}082432 - 1}{{\cdot}02}
\end{aligned}$$

(See my article January issue.)

(Here in turn we multiply both sides by 1·02; substract 4·122 from both sides; divide both sides by ·02, in brief.)

But, as a general statement for the more mature arithmetician, we would have:

$$\overline{s}_{\overline{n}|} = 1 + (1+i) + (1+i)^2 + (1+i)^3 + \ldots + (1+i)^{n-1} = \frac{(1+i)^n - 1}{i}$$

However, in tracing our theory to the end, in the case of a sinking fund we do not require the amount of 1 p.a. in itself, but rather do we want its reciprocal $\frac{1}{\overline{s}_{\overline{n}|}}$, or $\frac{i}{(1+i)^n - 1}$. Thus we might argue that if 1 p.a. amounts to 5·20404 in five years, what sum p.a. will amount to 1 in the same period? This is merely simple proportion. Therefore, we have:

$$\frac{1}{5{\cdot}20404} = {\cdot}192158, \text{ to five places of decimals.}$$

Thus £·192 per annum in five years, at 2% p.a., amounts to £1. ∴ £·192 = the sinking fund as—

	£
Instalment at end of first year	·192
Interest at end of second year	·004
Instalment at end of second year	·192
Total P. and I. at beginning of third year	·388
"	·008
"	·192
"	·588
"	·012
and so on to	·192
"	·792
"	·016
fifth year	·192
	1·000

Under the above theory we will observe again that the last instalment earns no interest. In actual practice this instalment is never made at all.

Finally at this stage (and we must all agree) tables under $\frac{1}{\overline{s}_{\overline{n}|}}$ etc., may

be evaluated under the process of arithmetic little higher in grade than that taught in the infants' class at our various schools. That we discover so many thwarted, dull adults with respect to arithmetic is not so much due to the procedure thereon being inherently difficult, but more from the fact that the subject is imparted in a haphazard and dilatory fashion. Arithmetic is not made nearly so interesting as it should be at the school age.

For some more practical work with regard to the function of the sinking fund as it relates to the depreciation of the various wasting assets of a business undertaking, we might say as follows: We all recognise that an ordinary charge against profit and loss account for the purpose of depreciating some or more of the fixed or wasting assets, may mean simply that the assets concerned will be either written out of the books altogether, or reduced to what is known as residuary value at the end of the stipulated period. Such a procedure is good book-keeping if carried out intelligently, since it tends to show net profits in correct perspective. We say "tends," since depreciation can never be much more than an estimate of what should be a charge for this expense. However, the stabilising of profits by providing for the correct amount of depreciation does not necessarily mean that the business involved will have the same amount of ready cash to meet the cost of the asset to be replaced at a moment's notice, or at the requisite time. But nevertheless we will always be aware that so much funds have been retained commensurate with the charge for depreciation, still, again, this does not make the path easy for the withdrawal from a business of a large sum of money at scant notice to meet replacements as and when they become due. In fact such a climax might very well cause a serious fall-off in trading capacity. In many instances, no doubt, we could say that in asking for the withdrawal from a business of £500 it would be tantamount to a request for the shutters to be put up.

Then if depreciation charge is at all extensive, the one way open for successful operation is for the management to provide for a sinking fund outside the business. Where such a course is decided upon we have what is known as "Depreciation under the sinking fund system."

The salient features here are that when the cost of the asset, its residual value and useful life are ascertained as near as possible, it becomes necessary to provide for an instalment which if invested at compound interest will amount to any required sum at the given time. For example, if plant and machinery cost £2.000 and residual value at the end of ten years is expected to be £100, the sinking fund instalment would need to be such that £1,900 will become available in the ten years for the purpose of replacing the worn-out asset. By that method the instalment is equivalent to the period (yearly in this case) charge for depreciation. In this, profit and loss account receives the debit, while depreciation fund account takes the corresponding credit entry. Hence we observe the asset account is shown at full value until the end, when it is closed to depreciation fund account. There is also depreciation fund investment account, which reflects the amount of instalments plus accumulated interest earned over the period. This account is also closed upon the receipt of the full sum of investments at the close of the period.

On the question of forming our sinking fund (readers are warned not to confuse the insurance policy system of depreciation with that of the sinking fund system—there is some likeness in certain respect—but any good text, such as Carter's "Advanced Accounts," rather fully explains all details) we might arrange our own investments, which may, or may not, earn the rate of interest estimated at the time when the fund was mooted.

This would mean that if the fund was deficient, or in excess, by such estimation at any period, profit and loss account would lose, and be debited

in the event of deficiency, and would gain from a credit entry in the event of an excess due to enhanced rate of interest over and above that stipulated. We recommend our readers to the many excellent text-books which explore this accountancy feature to a degree of great detail—demonstrating all journal entries, etc. Buxton's "Book-keeping Simplified," a Pitman series, is a very useful work for the beginner.

As a more comprehensive illustration, let us assume as follows:

Say an asset, plant and machinery, is purchased for £32,000 and its estimated life is taken to be five years. The management desires a sinking fund method of depreciation in order that the original sum will be available at the end of the period. It is expected that instalments to the fund will earn 3½% per annum. What should be the amount of the annual instalment to investment fund?

From the theory demonstrated previouslv. we are now in a position to take up anv good table (say Archer's or Kent's) and complete in almost instant fashion:

$$32{,}000\left(\frac{1}{s\overline{5}|}\right), \text{ at } 3\tfrac{1}{2}\% \text{ p.a.} = \cdot 18648137 \times 32{,}000 = £5{,}967\cdot 404.$$

$\therefore$ £5,967·404 = the sinking fund instalment for the replacement of £32,000 in five years, interest at 3½% per annum.

Should there be no table available, we would obviate the necessity of compiling such, as in the foregoing, by consulting our table of logarithms as hereunder:

$$\begin{aligned} \text{Log } 1\cdot 035 &= \cdot 01494035 \\ 5 \text{ times } \quad " \quad " &= \cdot 07470175 \\ \text{Antilog} &= 1\cdot 1876863. \\ \text{Then,} \qquad & 1\cdot 1876863 - 1 = \cdot 1876863. \end{aligned}$$

$$\text{Also,} \quad \frac{1}{s\overline{5}|} = \frac{\cdot 035}{\cdot 1876863} = \cdot 18648137, \text{ as before from table.}$$

Regarding the above problem. we will find it convenient to work on the assumption that plant and machinerv were completely installed bv the 1st July, 1935. Thus the first sinking fund instalment and the corresponding charge for depreciation will be made as at the 30th June, 1936. In actual practice, however, we mav find that cash and accumulated interest thereon would not be invested until the 1st July of each succeeding vear. Therefore, we have the problem stated for our purpose on theoretical lines merelv. To explain in brief just what the various entries entail in the books of account. we debit profit and loss account with £5,967·404 and take the credit entrv corresponding thereto to depreciation fund account. This would be by journal at the 30th June each year and for the five vears involved. On the pavments side of the cash book (sav, at the 30th June, 1936) we would have £5.967·404. while this credit would be offset by making the debit in depreciation fund investment account. On the receipts side of the cash book at the end of the second year we would show interest (£208·859) received on first year's instalment and the corresponding credit would be placed to depreciation fund account. On the pavments side of the cash book, same date—theoretically—there would appear £208·859 + £5.967·404 = interest on first year's instalment to sinking fund investment and second year's instalment to the investment fund. the corresponding debit going to depreciation fund investment account.

This procedure would obtain for all remaining years—accumulated interest being added to each instalment. such instalment assuming a constant quantity

throughout the whole period of operation. But notice carefully that our last instalment is not actually invested at all. This, of course, was explained in theory outlined previously.

Examine the form of skeleton accounts presented as a guidance for us further over. What a perfection in niceness?—every account balanced to the nearest farthing. Here, to be sure, we have the fondest dream of the true theorist. Still, the earnest theorist would desire something further: maybe that we, his auditors, will have the grace to show our appreciation for reasoning suggested by using the maximum of sagacity and imagination in applying his philosophy to the best possible needs as the case may require in common practice. We may say (without making any bones about it either) that he who is unable to utilise sound theory is probably not a very good practitioner. We invariably consider the student willing to fall back on those threadbare phrases, "looks all right on paper," and "sounds good in theory," etc., etc., has stamped himself as one badly beaten long before the bugle to advance has been sounded. And, again, that so-called "practical" man. How the unthinking masses fairly rave over him! As a matter of fact, this "practical" man, whom they may seek to glorify, is generally some person with full command of requisite theoretical knowledge, and, what is more than likely, one who knows exactly how to take advantage of that equipment. An individual of this calibre can never be classified as a billy-goat in his particular calling. Nor are we entitled to place him in the category of a "practical" man. Now take the subject with which we have treated in the foregoing pages: why, it fairly bristles with theoretical implication; yet the science may be applied with the greatest of ease in practice, provided the person under whose charge it is at the precise moment uses that reasonable amount of care and forethought to be expected from a competent accountant.

First, we may ask with respect to the sinking fund system of depreciation: Will the vogue which is peculiar thereto fit in with the circumstances as they appear?

Second: May we vary the procedure indicated in such a system by little or much?

Two very vital enquiries, and, as a further warning to the inexperienced, and others, maybe the unheeding, we have to say that theory alone does not guarantee efficiency of service. More, when our special research is to be in the field of depreciation as it relates to wasting assets in industry, we become super super optimists when ordinary text-book writers are depended upon to supply the missing information. No, gentlemen, it isn't so easy as all that. We remember some years ago asking our lecturer (at the end of his lecture) a certain question pertaining to the subject lectured upon. His reply was: "And what would you do in the circumstance?" We told him. He came again: "Yes, that's right." And, quickly afterwards: "Next question, please." Anyhow, it is not much good being too hard on the poor lecturers and our various text-book writers. Just try and visualise the terrible headaches these poor fellows will get in endeavouring to explain the wonderful "simplicity" of the Federal Uniform Taxation Act. We should say after perhaps one change of Parliament the services of Professor Houdini, if we could bring him back, would be extremely handy as a standby in elucidation. Notwithstanding, it is a great boodle-producer.

But, in all seriousness, what a study depreciation has become when we compare the procedure therein to-day with that seemingly in existence thirty years ago? Some specialists assert that this branch of accountancy has at last tended to an exact science. Whilst we have to take a statement such as the above with a grain of salt, so to speak, present day researchers on behalf of depreciation have improved enormously on the crude structure of investigation

in this regard practised by early students. At the present period we find that huge undertakings in the commercial world have their very own staff of specialists (comprising engineers, cost accountants, and others with high qualifications) set up to satisfy depreciation problems insofar as may be possible. There can be no half-boiled theories or monkeying about in this connection when, perhaps, ten to twenty-five million pounds' worth of industrial plant and machinery may have to receive careful consideration in respect of renewals, repairs, and then the annual charge for an average depreciation cost. Here we would assume correctly that the chief cost accountant's position could be no sinecure. Readers would be well advised to gather and study some of the reports on depreciation that have been submitted from time to time by the various committees of experts for the benefit of the boards of management under whose sanction such committees have worked. By the way, if we remember rightly, the committee set up to examine the depreciation question in the case of the London County Council were entirely hostile (with good reason) regarding the annuity and sinking fund systems. Yes, the question of expired capital outlay is a "nice" point in the science of Accounting. Or shall we write the same one hundred and fifteen pounds 16/2 worth of plant and machinery out of the books for the umpteenth time? That's fair enough, isn't it? But a "practical" accountant wouldn't countenance that measure, would he?

The ledger accounts in skeleton form of plant and machinery, depreciation fund and depreciation fund investment, are set forth as hereunder:

Dr. PLANT AND MACHINERY ACCOUNT *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
		£			£
July 1, 1935	To Cash	32,000	June 30, 1940	By Depreciation Fund .	32,000

This account is kept open throughout the five years, being closed off by transfer from depreciation fund account at the end of such period.

Dr. DEPRECIATION FUND ACCOUNT *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
		£			£
June 30, 1936	To Balance	5967·404	June 30, 1936	By Profit and Loss A/c.	5967·404
June 30, 1937	To Balance	12143·667	July 1, 1936	By Balance	5967·404
			June 30, 1937	„ Interest, 3½% ..	208·859
			„	„ Profit and Loss A/c.	5967·404
		12143·667			12143·667
June 30, 1938	To Balance	18536·099	July 1, 1937	By Balance	12143·667
			June 30, 1938	„ Interest, 3½% ..	425·028
			„	„ Profit and Loss A/c.	5967·404
		18536·099			18536·099

June 30, 1939	To Balance	25152·266	July 1, 1938	By Balance	18536·099
			June 30, 1939	„ Interest, 3½% ..	648·763
			„	„ Profit and Loss A/c.	5967·404
		25152·266			25152·266
June 30, 1940	To Transfer Plant and Mach. A/c. ..	32000·000	July 1, 1939	By Balance	25152·266
			June 30, 1940	„ Interest, 3½% ..	880·330
			„	„ Profit and Loss A/c.	5967·404
		32000·000			32000·000

Dr. DEPRECIATION FUND INVESTMENT ACCOUNT *Cr.*

Date	Particulars	Amount £	Date	Particulars	Amount £
June 30, 1936	To Cash Instalment	5967·404	June 30, 1936	By Balance	5967·404
July 1, 1936	To Balance	5967·404	June 30, 1937	By Balance	12143·667
June 30, 1937	„ Cash Instalment and Interest ..	6176·263			
		12143·667			12143·667
July 1, 1937	To Balance	12143·667	June 30, 1938	By Balance	18536·099
June 30, 1938	„ Cash Instalment and Interest ..	6392·432			
		18536·099			18536·099
July 1, 1938	To Balance	18536·099	June 30, 1939	By Balance	25152·266
June 30, 1939	„ Cash Instalment and Interest ..	6616·167			
		25152·266			25152·266
July 1, 1939	To Balance	25152·266	June 30, 1940	By Cash Investments Realised	32000·000
June 30, 1940	„ Cash Instalment and Interest ..	6847·734			
		32000·000			32000·000

War-time Responsibilities of Business Executives

By C. L. S. HEWITT, B.COM., A.I.C.A., A.C.A.A.

National Security (Agricultural Machinery) Regulations

These regulations provide for the control of the manufacture, distribution, use and repairing of agricultural machinery. The Minister for Commerce is empowered to make orders restricting dealings in agricultural machinery.

National Security (Agricultural Aids) Regulations

These regulations, which repeal the National Security (Fertiliser Control) Regulations, provide for the manufacture and distribution of agricultural aids in accordance with the order of priority determined by the Minister for Commerce and Agriculture.

The regulations define agricultural aids as agricultural chemical, animal fertiliser, feeding meal and fertiliser.

National Security (External Territories) Regulations

An amendment to these regulations provides for the setting up of an Australian New Guinea Production Control Board to promote and control production of copra, rubber, and other primary products in Australian New Guinea, and to arrange for the transport and purchase of these products and the products of any industry within the Territory. The amendment also provides for the entrance of the lessees of any land in the Territory or an employee of any lessee in the Territory for the purpose of carrying on production.

National Security (Supplementary) Regulations

An amendment to these regulations provides that where a lock-out or stoppage of work occurs at any particular undertaking, and the Prime Minister is satisfied that the lock-out or stoppage occurred because without lawful excuse the employer or employee failed to carry out obligations under laws or industrial awards or any other determination specified in the amendment, the Prime Minister may declare that any exemption from service in the Defence Forces that has been granted shall cease, or that an employee shall cease to be a person employed in a protected undertaking.

A further amendment provides for the Prime Minister to declare, under certain circumstances, any undertaking to be a protected undertaking.

National Security (Rationing) Regulations

Amendments to these regulations empower the Rationing Commission to enter into agreements with any local government authority for the performance of any of the Commission's duties and functions. Similar provision is made for the Commission to enter into arrangements with banks for the same purpose.

Taxation Section

Edited by J. A. L. GUNN, F.I.C.A.

INCOME TAX RETURNS

FOR YEAR ENDED JUNE 30, 1943

Income Tax return forms for year ended June 30, 1943 (or substituted accounting period) are now available to the vastly increased army of taxpayers. Taxpayers, other than companies, must use one of the three forms issued, viz.:

Form S. For use by taxpayers who derive income from *personal exertion only*, but who do not carry on a business or profession;

Form A. For use by taxpayers who derive income from *personal exertion and from property*, but who do not carry on a business or profession;

Form B. For use by taxpayers who carry on a business or profession, and by partnerships and trust estates.

At the time of writing these notes, the forms to be used by companies were not available.

Form S

This form is intended to cater for the vast majority of taxpayers, that is, those whose income is derived from salaries or wages, pensions, and the like. It provides for only six classes of personal exertion income and for two classes of deductions—

a. Subscriptions to trade, business or professional association or union, and

b. Any other deductions.

A taxpayer with some Savings Bank interest will have to face the more advanced Form A.

Item 4 of the income section deals exhaustively with pay and allowances of members of the Defence Forces. The new form will give the Commissioner much of the information which previously was obtainable only after writing a special letter to the taxpayer.

The back of Form S is designed to extract particulars in respect of the concessional amounts subject to a rebate of tax. The taxpayer is warned that the rebate will not be allowed if full information is not given. He is not expected to know the amounts subject to the concessional rebate in respect of the spouse, female relative, daughter-housekeeper, housekeeper, mother, children and invalid children. The relevant columns are wisely marked for "office use only."

In previous years, where a taxpayer furnished his first return of income, the Commissioner was satisfied with an explanation as to why returns were not furnished previously. A mere explanation no longer satisfies the Commissioner. In the case of a first return, the taxpayer must "attach a statement giving reasons, and showing date of birth and income for each of the previous three years." This statement appears on the simple Form S, as well as on the more complicated Forms A and B. This innovation will be a real burden on employers and tax agents alike, and will aggravate the already serious position arising out of staff shortages and inexperienced staff.

With the taxable income beginning at £105, thousands of new taxpayers will require their employer and previous employers to supply them with particulars of earnings for each of the three years ended June 30, 1940, 1941, and 1942. It is felt that, particularly as regards the Form S, the earnings record of the previous three years could have been eliminated without loss to the revenue.

Form S does not contain an agent's certificate. Therefore, if the form is completed by an agent, he is required by S. 165 of the Commonwealth Income Tax Assessment Act to annex to the return the certificate of information.

Forms S, A and B require that the taxpayer's identity card number must be quoted.

Form A

As indicated at the beginning of this note, this form must be used by taxpayers who derive income from personal exertion and from property, but who do not carry on a business, trade or profession. Naturally, it is somewhat more complicated than Form S, but it is much simpler than Form B, as it eliminates all reference to sales, purchases, opening and closing stocks, deductions of business expenses, live stock schedules, statements by partnerships and trust estates.

The Commissioner appears to be particularly concerned with "travelling allowances," etc. Forms A, B and S require that "all such allowances *must* be shown." Expenditure deductible in respect thereof may be claimed under deductions.

The statement of interest received now requires particulars of:

i. Interest on Commonwealth Government Loans issued prior to January 1, 1940.

ii. Interest on Commonwealth Government Loans issued after January 1, 1940.

iii. Interest on State Government Loans, Municipal Loans, etc.

iv. Other interest.

In the case of other interest, from mortgages, fixed deposits, etc., the amount of principal at July 1, 1942, and at June 30, 1943, must be given, also the rate of interest in each case.

As in the case of Form S, the statement requiring particulars relating to the amounts subject to the concessional rebate must be carefully completed, otherwise the taxpayer may receive his assessment minus the rebate. Medical and funeral expenses claimed must once more be supported by receipts. Last year the Commissioner, at least in New South Wales, was satisfied with a list. As in the case of Form S, Form A does not provide for an agent's certificate. It will have to be annexed where an agent prepares the return. This apparently was an oversight, and it is hoped that a supplementary supply of forms will be issued containing the form of agent's certificate.

Form P

This form is to be used by taxpayers deriving income from a profession, trade or business, including farmers, graziers, etc., and by partnerships and trust estates.

Farmers and graziers will be required to furnish *detailed* information regarding their wool clips, wheat crops, wool and wheat reconciliation statements, sales and purchases. Part C, which deals with the income from a profession, trade, business, manufacture or concern, calls for a Balance Sheet and Trading and Profit and Loss Accounts. It is presumed that, where applicable, the Commissioner will also require a Manufacturing Account.

In the past, the Commissioner required these documents only in the case of companies. Companies have to prepare these financial statements under the Companies Acts of the several States, and it is no extra burden to supply a copy to the Commissioner of Taxation. But do the great majority of doctors, dentists, small shopkeepers and tradesmen, etc., prepare Balance Sheets, Trading and Profit and Loss Accounts? The position appears to be that if the Commissioner requires these documents to be attached to Form B he will have to supply the necessary staff to prepare the statements, or use his influence with the Manpower authorities to release sufficient accountants to cope with this new business.

The forms referred to in this note are those which have been issued by the Deputy Commissioner of Taxation, New South Wales. It is assumed that, under the Uniform Tax plan, the forms will be uniform in all the States of the Commonwealth. The new forms are an improvement on the previous forms in use, but, in view of the acute staff shortages in the legal and accountancy professions, it is considered that some of the refinements could have been left until the return of less distressing days.

Private Companies

Where Calculation of Distributable Income Results in a Minus Quantity

Additional tax is levied against a private company under Division 7 on the "undistributed amount," i.e., the amount by which the dividends, if any, paid by a private company out of its taxable income of the year of income fall short of a sufficient distribution of its distributable income.

"Distributable income" means the amount obtained by deducting from the company's taxable income the following items:

a. Commonwealth ordinary income tax paid in the year of income; but a company has the right to elect to have deducted Commonwealth ordinary income tax *payable* in respect of the income of the year of income in lieu of tax paid during that year.

b. Any tax paid in the year of income by the company under Division 7 in respect of its undistributed income of previous years.

c. Any State or Territorial income taxes paid in the year of income, if those taxes have not been allowed or are not allowable as deductions under S. 72 in any assessment for any financial year.

d. Any tax paid in the year of income in any country out of Australia in respect of income of the company which is also subject to Commonwealth income tax.

e. Any net loss, of an income nature, incurred by the company in the year of income in carrying on its business out of Australia.

If the company receives a refund of any of the taxes referred to in (a), (b), (c) or (d) above, the refund must be brought to account in calculating the distributable income to the extent of the taxes allowed as a deduction in that income year.

A private company shall be deemed not to have made a sufficient distribution of its income of the year of income unless, within the prescribed times, it has paid in dividends, out of the taxable income of that year, the whole of its distributable income.

It may happen that the deduections allowable from the taxable income in determining whether or not a private company has made a sufficient distribution of its distributable income will exceed the amount of that taxable income, e.g.:

Income year ended June 30, 1942—

Taxable income		£50,000
Dividend paid	£7,000	
Taxes paid	63,000	
		70,000
Excess		£20,000

The dividend paid, £7,000, will, in effect, be carried forward in the assessment of private company tax of subsequent years to the extent provided by S. 106.

There is, however, no provision in the Commonwealth Act which enables the excess of taxes paid, £63,000 over the taxable income, £50,000, viz. £13,000, to be carried forward as a credit in calculating the distributable income of any subsequent year.

The answer to the above problem is, therefore:

Taxable income	£50,000
Taxes paid	63,000
Distributable income	Nil

Dividends paid, £7,000, are deductible under S. 106 from subsequent assessment or assessments, as an excess distribution of a previous year. For example:

Income year ended June 30, 1943—

Taxable income		£50,000
Taxes paid		20,000
Distributable income		£30,000
Dividends—		
Out of taxable income of year ended June 30, 1943	£10,000	
Allowance under S. 106, as above	7,000	
		17,000
Undistributed amount		£13,000

Right to Remove Sand, etc., From Soil

Whether purchase of goods or profit à prendre

The taxpayers in the first case were sand and gravel merchants. By an agreement, to run for three years with an option of renewal, they bought all the sand and gravel upon a certain parcel of land, paying therefor a fixed sum per ton of all sand and gravel removed. In the second case, the taxpayer company, by agreement, bought all the coal which it could "actually sever from the soil or freehold and thereby convert into chattels personal" from specified seams during the following two years; the agreement expressly stated that it was not a mining lease or licence nor the grant of a *profit à prendre* (right of taking the produce or part of the soil from the land of another person), but a contract for the sale and purchase of goods. In each case the taxpayers contended that the agreement was for the sale and purchase of goods forming their stock in trade, and that the payments thereunder were accordingly deductible. *Held* that the agreement in each case granted a

profit à prendre which was a "right, privilege or benefit in, over or derived from land" within the meaning of S. 21 of the English Finance Act, 1934, and that the payments under the agreements were not deductible (*Stratford v. Mole & Lea; Old Silkstone Collieries Ltd. v. Marsh* (1941) 24 Tax Cas. 20).

Tasmanian Income Tax

Commissioner cannot issue amended assessments for income years prior to 1935-1936

A Tasmanian taxpayer had been assessed to income tax for the financial years 1915-1935 inclusive pursuant to various Tasmanian Income Tax Acts, and the Land and Income Taxation Act, 1910. All these assessments had been paid by the taxpayer, who died on July 25, 1935. In October, 1938, the Commissioner made an amended assessment (increasing the tax by £5,107) against the trustees of the deceased taxpayer's estate on the ground that he had omitted to make a full and true disclosure of all material facts necessary for his assessment in respect of each of the above years.

All the Acts fixing or imposing rates of tax prior to 1924 were repealed prior to the alteration in the assessments made by the Commissioner. None of the Acts imposing or fixing rates subsequently to 1924 were repealed: but the provisions of the Land and Income Taxation Act, 1910 (which provides for the assessment of Income Tax) were substantially amended by the Land and Income Tax Act, 1935, which repealed sections 27-69, and substituted other sections in their stead. Sections 127 and 128 of the latter Act provide for assessments and amendments, and took the place of repealed sections 58 and 61 of the 1910 Act; the new sections greatly altered the basis of assessment. There was no saving clause in the 1935 Act.

Held: (1) Except as to transactions past and closed, or rights saved by the Acts Interpretation Act, the repealed Tax or Rating Acts must be treated as if they never existed. Consequently, none of the amended assessments in respect of the years prior to 1924 could be sustained; and the appeal should be dismissed with respect to these assessments. (2) (Starke, J. dissenting) The amended assessments made in respect of the years 1924-1935 could not be sustained under the provisions of the substituted sections inserted by the Land and Income Tax Act, 1935, and the appeal should therefore be dismissed with respect to these assessments also. *C. of T. (Tas.) v. Exors. of Benjamin Nathan dec'd.* (not yet reported).

War-time Company Tax Regulations Relating to Statutory Percentages

War-time (Company) Tax, at graduated rates, is levied upon the amount by which the taxable profit, as defined, derived during the accounting period exceeds the "percentage standard." The percentage standard is an amount equal to the "statutory percentage" of the capital employed during the accounting period. Subject to the following provision, the present statutory percentage is 5 per cent.

Section 21 (1) of the War-time (Company) Tax Assessment Act provides that if the Board of Referees is satisfied that, owing to some unavoidable conditions associated with any class of business, it is just that a greater statutory percentage than 5 per cent. should be prescribed, regulations may, in respect of that class of business, prescribe such greater statutory percentage as the Board, after inquiry, recommends.

A claim for an increased statutory percentage must be made not later than the end of the first year of tax in the assessment for which it is claimed that

the greater statutory percentage should apply. For example, a claim in respect of accounting period ended June 30, 1943 (or substituted period) must be lodged not later than June 30, 1944.

Increased statutory percentages have been granted in respect of the following classes of businesses:

Open-cut Scheelite Mining	10 per cent.
Airline Operating	6 per cent.
Tin Mining	8 per cent.
X-Ray and Electro-Medical Apparatus	5½ per cent.
Brickmaking	6 per cent.

Commonwealth Gift Duty

Bad Debts

A subscriber has asked whether an amount representing bad debts written off is, in any circumstances, liable to Commonwealth Gift Duty.

The same question was addressed to the Commissioner of Taxation by the Taxpayers' Association of New South Wales and the Commissioner replied as follows:

"The extent to which bad debts written off are liable to gift duty is a question of fact which can only be answered in the light of the circumstances affecting the particular case.

"However, it can be said that the Gift Duty legislation was not intended to apply to ordinary commercial transactions and is being administered in accordance with that intention.

"The specific provisions of the Act which ensure that Gift Duty shall not be applied to ordinary commercial bad debts are contained in Section 14 (f), which reads as follows, viz.:

14. Notwithstanding anything contained in this Act, Gift Duty shall not be payable in respect of—

. . . . . .

(f) any gift which is made in the course of carrying on a business, for the purpose of obtaining any commercial benefit or by way of the writing off of a debt which is irrecoverable, by—

(i) an incorporated company the shares or stock of which are or is quoted in the official list of any Stock Exchange:

(ii) an incorporated company the shares or stock of which are not or is not quoted in the official list of any Stock Exchange, if the Commissioner is satisfied that the donee is not a director of the company or is not connected by ties of blood or marriage with any director of the company; or

(iii) a firm or individual if the Commissioner is satisfied that the donee is not connected by ties of blood or marriage and any member of the firm or with the individual, as the case may be."

Tax on Undistributed Incomes of Private Companies

Allowance in Respect of Excess Distributions of Previous Years

Section 106 (1) provides that where the total amount of dividends paid by a private company *out of its taxable income* of the period of four years next preceding the year of income exceeds the aggregate of the smallest amounts that would have been a sufficient distribution in each of those years, the excess shall, for the purpose of calculating the undistributed amount, be deemed to be a dividend paid out of the taxable income of the year of income.

The taxpayer company's net *profit* for income year ended June 30, 1938, was £9,694, and the whole of that profit was distributed as a dividend. The company's *taxable income* for the same year was £2,248. The difference of £7,446 between the profit and the taxable income was due to the allowance in the assessment of a deduction of that amount in respect of State income taxes paid during income year ended June 30, 1938. A provision for these and other taxes was debited in the Profit and Loss Account of year ended June 30, 1937, and was, of course, disallowed in the assessment of the company's taxable income of that year. The company claimed an allowance of the £7,446 under S. 106 in its assessment under Division 7 in respect of undistributed income of year ended June 30, 1940, on the ground that the dividend paid out of the profit of year ended June 30, 1938, was to the extent of £7,446 paid out of the taxable income of year ended June 30, 1937.

The Commissioner rejected the claim on the ground that to the extent (£7,446) to which the dividend paid out of the profit of year ended June 30, 1938, exceeded the taxable income of that year, it could not have been paid out of that taxable income; that as it was paid out of the profit of that year it could not have been paid out of the profit (or, consequently, out of the taxable income) of any other year, and that, therefore, the sum of £7,446 did not form part of the total amount of dividends paid out of the taxable income of the period of four years ended June 30, 1939.

Held by the Board of Review—claim disallowed (not yet published): "We agree with the Commissioner that a dividend paid out of the profit of one year cannot be said to have been paid out of the profit of any other year. Both the profit and the taxable income of any particular year form portion of the gross income of that year. Hence, the funds which constitute the profit of any year can never, either wholly or partly, be identical with the funds which constitute the taxable income of any other year. It follows that a dividend paid out of the profit of one year is necessarily not, to any extent, a dividend paid out of the taxable income of another year."

The Functional Aspect of Farm and Station Accounting

By A. Blake Forsyth

For many reasons, it is possible that the most difficult sphere of accountancy is that relating to farm and station accounts. The principal cause is the unique nature of a primary producer's business dealings, as there are no parallels to these in any other class of business, so that the allocation of farm and station expenditure to relevant accounts, and the subsequent preparation of a Profit and Loss Account, becomes the vocation of a specialist.

Expenditure

Nearly all primary producers nowadays carry on a combined business of grazing and farming, and the nominal accounts to be opened in the private ledger for items of expenditure are shown below:

1. Wages
2. Keep for Employees
3. Shearing Expenses
4. Repairs and Maintenance
5. Fodder and Farming Expenses
6. Droving, etc., Expenses
7. Noxious Animals Destruction

8. Freight and Cartage
9. Salt, Dip, Stock Medicines, etc.
10. Motor Vehicles and Tractor Expenses
11. Travelling Expenses.
12. Warehousing and Commission
13. Wool Re-grading Charges
14. Accountancy Fees
15. Telephone, Stamps, etc.
16. Exchange and Bank Fees
17. Sundry Expenses, n.e.i.
18. Rates and Taxes
19. Rents
20. Agistment
21. Insurances (General).
22. Interest
23. Depreciation

This classification will meet all normal requirements.

(1) *Wages*: There are several methods used in the treatment of wages, the most common method being to debit to this account wages which cannot be directly allocated to other accounts. Under this system, shearers' wages are charged to Shearing Expenses Account, and wages paid for ring-barking, etc., are debited to Repairs and Maintenance Account, and so on. The objection to this, and other methods, is that it is inconsistent, as the station hands are frequently employed in, for example, "bush work" (ring-barking, etc.) as part of their normal duties, and unless a system of time sheets is adopted, no allocation can be made. Therefore, Wages Account is more correctly disclosed in the Profit and Loss Account, as follows:

Wages—Station and Farm Hands	£500	0	0
Shearing Employees	200	0	0
Fencers	50	0	0
Bush Workers	150	0	0
	£900	0	0
Etc.	Etc.		

This method of detailing the classes of employees is of definite value to all concerned, as it is of considerable assistance in preparing Workers' Compensation Renewal Certificates, Pay Roll Tax Returns, and the schedule of employees required by the Taxation Commissioners.

Where shearing is done by contract, show the actual cost thereof as a separate item. (Note: The term "shearing" in the text includes crutching as well.)

(2) *Keep for Employees* (sometimes termed Stores and Rations): This account presents some difficulties and, unfortunately, there does not appear to be any definite ruling on the matter. There are two classes of employees in the pastoral industry—"found" and "not found." The "found" employees are those in receipt of certain allowances such as house, meat, etc., in addition to their cash wages. A man may be "found" in all the recognised allowances, or he may be "found" in only one of them. It depends on the terms and conditions of his employment. "Not found" employees are those in receipt only of a cash wage. Therefore, "found" employees are the only ones which affect this account. The Commonwealth Acts relating to income taxation and pay roll tax both set down rules for assessing the value of any such allowances, and as these represent a definite, though estimated, expense to the employer as well, they should be brought to account, especially in view of the fact that the employer is entitled to a deduction of the amount for

taxation purposes. However, to show this expense raises a difficult point, as the following example illustrates:

An employer has three "found" employees, the memoranda of agreement stating in each case "Value of allowances being 15/- per week," and such allowances are in fact cottage, milk, meat and wood. Thus, for twelve months the total of these items amounts to £117 for the three men. To supply the meat, two sheep per week are slaughtered, valued at 12/6 per head, and the homestead uses half a sheep per week from these. Thus, there is a debit to Stores and Rations for sheep killed amounting to £65, and a credit for house meat amounting to £16/5/-, leaving a debit balance of £48/15/-. But as shown above, the actual debit should be £117, and therefore the cost of cottage, milk and wood to these men for the twelve months is £68/5/-. How is this last-mentioned amount to be brought to account?

The most equitable method of showing the correct total is to credit Private Drawings with the deficiency, but show it as a separate item in the financial statements. My reason for advocating this somewhat unusual mode of treatment is that Private Drawings *reflects* the cost of these allowances. For example, in order to supply the milk, it is most likely that a houseman is employed, whose duties would include the milking, and this man's wages are, or should be, debited to Drawings.

(3) *Shearing Expenses*: As shearers' and shed hands' wages are charged to Wages Account (cf. 1 above), this account will then show the cost of shearing supplies used, such as wool packs, staples, emery, glue, twine, oil, grease, etc. Handpieces should be debited to Plant Account and depreciated in the usual manner therein.

(4) *Repairs and Maintenance*: This account should include all genuine repairs as distinct from improvements. Replacements of lost and broken tools are generally debited to this account. To show accurate expenditure under this heading, it is necessary to analyse some of the store accounts.

(5) *Fodder and Farming Expenses*: It is impossible to differentiate between expenses relating to (1) fodder consumed on the property and (2) fodder either bartered or sold, so that it becomes necessary to "lump" all such expenditure. This account therefore includes such items as seed, irrespective of whether the resultant crop has been sold or used on the property for fodder. Other items are bags, twine, etc.

(6) *Droving, etc., Expenses*: Expenditure charged to this account comprises permits, trainage on stock, yard dues, and amounts paid to *contract* drovers. If the employer exercises any control over the drover he is an employee, and all payments in such cases should be debited to Wages Account.

(7) *Noxious Animals Destruction*: The items chargeable to this account include the cost of cartridges, strychnine, and any of the numerous proprietary lines on the market used for rabbit and other vermin destruction. Sums paid to a rabbiter on a genuine contract are also chargeable to this account, but payments to a rabbiter on a weekly wage should be debited to Wages Account.

(8) *Freight and Cartage*: This account includes all freightage expenses, and the cost of trainage on wool to market should be included also. This latter item is deducted by the wool firm from the gross proceeds of the wool. Further reference is made to this under the heading "Wool Account" below.

(9) *Salt, Dip, Stock Medicines, etc.*, and

(10) *Motor Vehicles and Tractor Expenses* are self-explanatory and present no special difficulty. As to registrations of motor vehicles, see (18) below.

(11) *Travelling Expenses*: This account should reveal only actual out-of-pocket expenses incurred while travelling on business (e.g., inspecting sheep in a distant district with a view to purchasing same).

(12) *Warehousing and Commission* and

(13) *Wool Regrading Charges*: Both these items are deductions from the wool sales. Refer to Wool Account below.

(14) *Accountancy Fees,*

(15) *Telephone, Stamps, etc.,* and

(16) *Exchange and Bank Fees* do not require any explanation.

(17) *Sundry Expenses, not elsewhere included*: Normally this account should not require much use, but business expenditure of an infrequent nature may be debited here, also such annual payments as show subscriptions, levies payable to business associations, etc.

(18) *Rates and Taxes*: The normal items debited herein are Shire Rates, Land Tax, P.P. Board Rates and Wool Tax. There is no objection to charging motor vehicle registrations to this account, although as a general rule these expenses are debited to Motor Vehicles and Tractor Expenses Account. As to Wool Tax deducted by brokers from gross proceeds of wool, see under heading "Wool Account."

(19) *Rents*: This account should show only rents paid to the Crown for roads and other Crown leases. It is as well to remember that if a property is "rented" there may be a liability to pay additional Land Tax on such lease. As a general rule, most "rentals" are merely an agreement for agistment, i.e., grass rent. Therefore

(20) *Agistment* should reveal the cost of all so-called "rents."

(21) *Insurances (General)*: Obviously this account does not include life assurance premiums. It is used for premiums on fire insurances, workers' compensation policies, motor vehicles' policies and for sheeps'-back-to-store insurance. Also for fire insurance on wool while in store, but see under heading "Wool" below. A new item now appearing in this account is war damage insurance premiums.

(22) *Interest* and

(23) *Depreciation* do not require any explanation.

It is as well to tabulate accounts numbered from (18) to (23) inclusive. For example, Rates and Taxes Account would be shown as follows:

Shire	£98 13 4
P.P. Board	16 10 0
Land Tax	35 7 6
	£150 10 10

Income

The usual items of income are not numerous in a primary producer's accounts, as normally income is derived only from wool, hides and skins, farm produce and agistment.

Wool: Almost invariably, only the net proceeds of the wool sold are brought to account, apparently in the mistaken belief that the client is only interested in the cash actually received. Obviously, this method of treatment is bad accounting, and it is also contrary to the requirements of the Income Tax Assessment Acts. To record this account correctly, it is necessary to obtain the account sales and journalise the deductions made by the brokers shown therein. However, under the present Appraisement Scheme, there is one deduction to be treated with caution, and that is the 5% of the gross

proceeds retained by the Central Wool Committee as a reserve in case of an overvaluation during the season. Since the commencement of the scheme, however, there has been an undervaluation each season, so that graziers have received each year (about July 15) an additional percentage distribution as well as the 5% retention money. The Taxation Departments have recognised two methods of treatment, and as it is wise to keep the accounts in "line" with the return of income, one of the following methods should be adopted. Firstly, if the retention and adjustment money is not disclosed for taxation purposes until the year in which it has been actually *received*, then it is necessary to show the income from wool as an amount representing the gross proceeds *less* the retention money. Secondly, if the actual gross proceeds are returned (which then includes the retention money), it becomes necessary also to disclose the adjustment money in order to be consistent. In this method, there is a debtor account for the total of the retention and adjustment money, and the gross proceeds would also include the amount of such adjustment money. If, for any reason, it is required to disclose the net proceeds, this may be done by listing the deductions in detail with a sub-total, either on the expenditure side of the Profit and Loss Account or as a direct subtraction from the gross proceeds on the income side of this account.

However, these deductions should be treated as though cheques had been actually drawn in payment of them, in which case it is certain that accountants would always have treated them as normal items of expenditure, which, of course, they really are.

Other Income: Hides and skins, if sold through a broker, require much the same method of treatment as mentioned under "Wool." Other items of income should not present any special difficulties.

General

C.P. Instalments: It is not generally understood that payments on account of C.P. instalments comprise both capital and interest, as these payments represent the purchase of land over a term of years. The Lands Department will advise as to the balance due to the Crown on C.P's., and a liability should be shown in the books for this. A reasonably accurate allocation of the annual instalments is obtained if a transfer to Interest Account is made of one-third of the amount, the balance (viz., two-thirds) being debited to the liability, Crown on C.P's., account. A periodical check of this debt due to the Crown (say every five years) enables this account to be kept in order.

Barter: This system of bartering is fairly common in primary production, and it is as well to enquire as to the extent, nature, and value of any such transactions. Where two or more items have been exchanged which affect only one account, there is no necessity to make any entry except by way of record. Such a transaction takes place when hay is bartered for chaff, or a steer for a cow. But when sheep are exchanged for corn, or cows for a chaff-cutter (I have known both of these to happen) an entry must be made. In the two latter cases instanced, the live stock accounts would be overstated, either as to deaths or stock on hand, and Fodder Account and Plant Account respectively would be understated if the barter transaction was ignored.

Conclusion

Certain criticisms may be levelled at various aspects of this article, but it is impossible to adapt accounting theory to the difficult points arising out of farm and station bookkeeping. However, I trust that the above suggestions will be of assistance.

Credit as a Variable Factor in Industry

By LESLIE W. IRWIN, A.F.I.A., A.A.I.S., A.C.A.A.

From time to time, many organisations are faced with the decision of accepting or refusing to extend credit to potential clients. Often the principal factor in this decision is the ability of the client to pay, and many what may be termed "borderline" risks are passed by. This class of client may become beneficial if utilised in the proper manner.

Recent studies in the application of economic principles to the mechanics of industry has shown that in given circumstances it is desirable and beneficial to dispose of a quantity of goods at a loss. It is being more realised in industry that it is the total receipts and not the maximum of production that counts.

If a reduction in the element of price will result in a sufficient increased Sales Volume (and Total Receipts) with a consequent lower unit cost, and greater marginal return, it is the interaction of these elements that assist to build the profitable business.

This aspect of administration may be utilised in order to obtain the maximum benefits from the functions of the Credit Manager.

In Table I, the collectibility of the accounts of an organisation has been expressed in the relative percentage, denoting the expectation of each class to pay.

TABLE I

Class	Rating	Order Volume	Cash Receipts
A.	100%	£5,000	£5,000
B.	90%	5,555	5,000
C.	80%	6,250	5,000
D.	70%	7,150	5,000
E.	60%	8,330	5,000

In a business undertaking, the gradations may be much finer, and it is likely that the first three classes would comprise most of the Order Volume of the organisation. The proportion of each class would vary with the type of business being conducted. For instance in a chain store, very little of class B and under would occur whilst the Debtors of an emporium would comprise a varying proportion of the above ratings. Within an emporium we would also find that proportions would be affected by the nature of the articles sold, i.e., the Furniture Section may have all classes, but it would be difficult to imagine any credit classes in the Perfumery.

While the ratings are illustrative only they represent an effort to depict the classifications which arise in a person's mind when dealing with intangible items such as this. Among acquaintances we often hear the phrase "that he is a first-class risk."

In some industries, the cash customer, Class A, would be negligible, but for the purpose of this article the proportion would be of no importance.

Turning to the other side of a Company's activity, i.e., its production, which is measured by its capacity. This may mean its machine capacity, or labor, but it represents the ability of an organisation to produce at a certain level without extending its present facilities. This is important, because once this level is reached and it is desired to increase production, it may mean the extension of existing buildings or machines, and a subsequent increase in the Fixed Expenses of the organisation, such as Depreciation charges, or Rent, (both real or economic.)

It is assumed that the organisation being described has a productive capacity of £40,000, and that the present Sales level is £20,000 or 50%. It

is desired, however, to increase the Sales Volume to £30,000, but the management cannot foresee how the increased volume can be obtained as the present market has almost reached saturation point.

The following would represent an analysis of the types of expense at the varying levels:

Item	Production Capacity	Level of operations Present	Proposed
Fixed Expense	£6,690	£5,690	£5,690
Variable Expense	28,000	14,000	21,000
Totals	£34,690	£19,690	£26,690

Assuming that the Sales Volume is comprised of the classes A to C in Table I, in the following proportion; A. 65%, B. 20% and C. 15%, the Receipts for the varying levels would be:—

(a) *At Production Capacity—£40,000*

Class	Sales Volume	Receipts	Expenses	
			Fixed:	£6,690
A.	£26,000	£26,000	Variable:	28,000
B.	8,000	7,200		
C.	6,000	4,800		£34,690
			GAIN	3,310
	£40,000	£38,000		
				£38,000

(b) *At Present Capacity—£20,000*

A.	£13,000	£13,000	Fixed:	£5,690
B.	4,000	3,600	Variable:	14,000
C.	3,000	2,400		
				£19,690
	£20,000	£19,000	LOSS	690
				£19,000

If as previously indicated the management is faced with necessity to increase production in order to utilise spare capacity and the number of clients belonging to the above classes are not available, some steps would have to be taken. It is in a situation of this nature that the functions of the credit manager could be utilised. Assume that of £10,000 of Sales, only £3,000 would answer to the requirements of classes A. and B., in the proportion of 60 and 40 per cent., whilst in classes C. and D. the additional business offering is evenly divided, then the following statement would represent the new level:

At New Proposed Level—£30,000

	Volume	Receipts	Expenses	
			Fixed:	£5,690
A.	£14,800	£14,800	Variable:	21,000
B.	5,200	4,680		
C.	6,500	5,200		£26,690
D.	3,500	2,450	GAIN	440
	£30,000	£27,130		£27,130

If, however, the entrepreneur is cautious and decided to accept only the additional volume offering from classes A. and B., the position would resolve itself as follows:

Position if Risk is not Accepted: Additional Volume £3,000

	Volume	Receipts	Expenses	
A.	£14,800	£14,800	Fixed:	£5,690
B.	5,200	4,680	Variable:	16,100
C.	3,000	2,400		
				£21,790
	£23,000	£21,880	GAIN	90
				£21,880

It will be seen that by accepting the additional £7,000 worth of orders, with full knowledge that in all probability only £5,320 will be collected, the increased contribution of Receipts (£5,250) will more than offset the increase in Variable Expenses (£4,900), leaving the balance of £350 as the marginal gain or profit on the additional orders. It will also have the added advantage, which is of social significance, that more use is being made of machines and materials and labour than would be if the additional work had not been undertaken.

To obtain a further glance at the picture and effect, the analysis of Unit Costs and Unit Receipts is made in Table II.

TABLE II

Sales Volume	Unit Costs	Unit Receipts	Marginal Differential
£20,000	£0·984	£0·950	−£0·034
23,000	·945	·949	+£0·004
30,000	·890	·905	+£0·015
40,000	·867	·950	+£0·083

Unit Selling Price = £1.

Conclusion

The principles which govern the procedure laid down by the utilisation of unused capacity may easily be applied if the necessary information is available at the right moment.

It necessitates that an executive member of the organisation be made responsible, and the training and experience of the cost accountant indicates that this will be his sphere at some future date. The co-operation of other executives will ensure greater profits and more efficient organisation.

A Revaluation of Cost Accounting

By L. A. SCHUMER, A.I.C.A., F.C.A.A.

(The Fourth Commonwealth Institute of Accountants Research Lecture, delivered in the University of Melbourne, 1943)

Unremitting research is the essential ingredient in the development of any progressive science, and the establishment of the Commonwealth Institute of Accountants Annual Lecture was an acknowledgment of that doctrine in relation to the field of accountancy.

Nevertheless, a brief, single-minded, and widely spaced survey of the field, or of any of its parts, such as is attempted in any one of these lectures, cannot be anything more than an "annual stocktaking" for the purpose of roughly measuring progress and indicating the areas into which research should be directed, or in which it should be intensified. It is, therefore, but a token compliance with the obligations of the accountant to his profession and the community, and results of any value will not be obtained until each member accepts the viewpoint that he is under personal obligation to give as well as to receive.

Intense and honest research may not always be rewarded by the discovery of any new truth or of the need for revolutionary changes in theory or practice, because such would not be expected in a science in the process of evolution and adaptation to constantly changing conditions. Research does, however, provide the opportunity to tidy up our sprawling theories and stream-line our clumsy tools. We can re-state our doctrines in fewer and simpler terms; we can simplify and unify our practices, and prepare the ground for the advances and changes that the future will demand. It is essentially a process of revaluation. From time to time, and in particular directions, research may produce what may appear to be minute and insignificant results, but the aggregation of such small increments is all important in keeping accountancy in tune with its surrounding conditions.

The Inaugural Lecture in this series surveyed the field, issued the challenge, and indicated the kind of research to be undertaken. The two succeeding lectures were applied to specific areas in the field, dealing principally with the accounting concepts of capital and revenue, and the interactions of law and accountancy doctrines. My purpose this evening is to survey broadly the large area in the field of accountancy known as "cost accounting."

Although there are some traces of origin in the practices of the Sumerians of the Mesopotamian valley 5,000 years ago, this branch of accountancy has emerged since the beginning of the age that moved Edmund Burke to say, "The age of chivalry is gone. That of sophisters, economists and calculators has succeeded," and has grown in dimensions and influence with startling rapidity, mostly within living memory. In addition, we are now able to assess its utility and adaptation to a world at peace as well as its utility and adaptation in a world at war. In this brief moment, therefore, we will endeavour to lift ourselves from the forests of ruled forms, time clocks, accounting machines and stopwatches, and test our concepts, doctrines and practices by answering the following questions:

(a) What is cost accounting?
(b) What are its objects?
(c) To what extent are its objectives valid in a world demanding efficiency in economic activity?
(d) To what extent do its theories and practices require emphasis or amendment?
(e) In what directions should its functions be enlarged?

A satisfactory definition requires the statement of the truth in the fewest and simplest terms, and it appears to me that such desire is satisfied by defining cost accounting as "the processes of accountancy directed to the classification and interpretation of cost in terms of units of activity within economic enterprises." This is definition by *inclusion*, but, on the other hand, we may add to clarity by attempting to define by *exclusion*, i.e., describing the area in which cost accounting is not concerned. That step will require a brief survey of the whole field of accountancy and takes us back to origins.

Before the intrusion of the special processes we are reviewing, the basic purpose of accountancy was to provide a systematic record of the transactions of economic enterprises for three main purposes, viz.:

(a) to preserve the integrity of the funds and property of the undertaking on the proposition that "the recording of every transaction makes it harder to steal the funds of the concern";[1]
(b) to distinguish between "Capital" and "Revenue"; and
(c) to determine the equities in the property of the undertaking and its "profits."

This was virtually the whole field of accountancy, and the growing pressure of economic conditions led not only to improvement in the mechanics of recording but also to the acceptance of concepts, doctrines and rules surrounding the basic question of distinguishing between capital and revenue—the concepts, doctrines and rules being influenced not only by commercial practice, but also by law. For our present purposes, the following points are significant:

(a) The accounting records dealt only with the actual receipts and expenditures in terms of money;
(b) The accounting periods, in respect of which revenue and capital were apportioned, were equal in length and selected after having regard to natural seasons, agreements concerning determination and distribution of profits, and the requirements of the law relating to taxation;
(c) Rational apportionments between accounting periods were always overshadowed by the doctrine of conservatism, voluntarily imposed by commercial men;
(d) there were substantial inter-actions with the law which imposed checks on the financial integrity of certain types of undertakings and also limited freedom in the interpretation of "capital" and "revenue"; and
(e) Classification of transactions entering into "revenue" was limited to the degree necessary for ensuring accuracy in computations, or for complying with provisions of the law (e.g., disclosure of sources of profit in accounts of companies, and particular classification of transactions for taxation purposes).

These same doctrines and processes still permeate economic enterprises and will ever be of great importance, but the modern expansion of the field of accountancy calls for some title being given to the original function. Various terms have been used, as, for example, "General Accounting," "Financial Accounting," and "Proprietorship Accounting," and the last name appears to be appropriate because of its emphasis on the proprietary aspects.

Intense classification of data is inherent in cost accounting and provides a valuable aid to proprietorship accounting because apportionments to capital and revenue can be based on more precise facts, and on a greater number of them. Essentially, however, cost accounting has different objectives, for its

1. J. M. Clark, *The Incidence of Overhead Costs.*

very existence arose from the inability of the other accounting processes to supply data for which there was an insistent demand. That demand became articulate when the individual craftsman began to be superseded by the organised, power-operated factory; when the diversity of manufacture increased; when the area of markets extended beyond the bounds of the craftsman's village; and when competition between producers reached significant proportions. The demand has become more insistent as the size of economic enterprises and the complexities of production have increased—and the demand has spread from the factory to all other kinds of economic activity. Perhaps it may be true to say that whilst an existing demand brought cost accounting into being, the development of cost accounting has permitted or aided the growth of the large-scale enterprise and the increasing diversity of commodities and services available to the community.

In essence, the original demand was for information which could be used to establish the selling prices of commodities. The individual craftsman, with his limited range of products, and the insignificance of external costs, had no mathematical troubles concerning prices. On the other hand, the factory owner was confronted with a mass of costs of all kinds covering a diversity of products, and apportionment of those costs to the products was a means of fixing selling prices, or of testing the adequacy of those offering in the market. Concurrently, there was the problem of ascertaining the cost of products for inclusion in balance sheets as Stocks on Hand. The intensification of competition between producers placed an added value on cost information because production at the lowest possible cost became vital to survival, and cost data could be used to compare and measure efficiency of activities.

Stated formally and precisely, the objective of cost accounting is to assist the management of economic enterprises by providing data pertinent to:

(a) the establishment of policies in regard to the prices that ought to be charged, or will be accepted, for the goods or services sold by the enterprise;

(b) the establishment of policies in regard to the range of goods that will be produced or sold, or the services that will be rendered, to provide the maximum profit to the undertaking, or alternatively, result in the lowest possible average cost per unit of product or service;

(c) the control and valuation of stocks of merchandise, materials, and products in the course of manufacture; and

(d) the comparison and measurement of efficiency of activities of the enterprise as a whole, or in its separable parts.

These purposes do not have equal value, nor is their relative importance static, because the nature of the undertaking and the changes in surrounding conditions tend to alter the relative positions.

Units of Activity

The objects of cost accounting are achieved in two steps, viz.:

(a) classifying cost in terms of units of activity;

(b) interpreting the information thus obtained.

We shall see shortly that varying concepts of cost may be involved, but for the moment it is desirable to be clear as to the term "units of activity."

The total activity of an undertaking within a conventional accounting period may be regarded as a unit of activity because it is a definite segment of the ultimate total activity. In cost accounting, however, we are concerned with the different kinds of activity within the enterprise, and with different

quantities of any kind. The essential features of a unit are that the activity should be capable of recognition apart from others and that the content should be definable as a specific quantity of things done, or to be done, or as the doing of a certain thing for a specified period. In one case a unit of activity is defined by quantity without limitation by time, and in the other case the unit is defined by time without limitation by quantity.[2]

In any enterprise, the pattern created by the division of activities into units may be simple and singular, but in most instances the patterns are of some variety and designed for diverse purposes. Each pattern may completely cover the total activity, each from its own viewpoint. On the other hand, a pattern may be merely one part of another pattern divided into smaller parts.

Patterns of units of activity may have a permanent value, and the accounting routine directed continuously to the determination of cost in terms of the units within these patterns. On the other hand, the patterns may be of only transient value and the selection of new patterns is an endless process according to the needs from time to time.

Deviations in Outlook, Concepts and Mechanics

Not only do the purposes of cost accounting differ from those of its older partner, but there are deviations in outlook, concepts and mechanics already in evidence. The examination of those deviations is of interest and importance for the purpose of determining their validity, and also for the purpose of ascertaining the extent (if any) to which further deviations are desirable, and should be encouraged.

Revolutionary advances in scientific knowledge have always followed the discovery of new means of measurement or of expressing thought; indeed, stagnation usually provides the pressure necessary to burst the confining walls. For over 2,000 years, the geometry of Euclid was deemed to be a necessity of thought in the pursuit of knowledge in the fields of physical and cosmical science until the end of knowledge appeared to be in sight. The discovery of other geometries and their application to the "dead-ends" of enquiry has enabled further advances of great importance to be made, particularly in understanding and expressing the laws of nature in the universe and in the atom. The conclusion to be drawn is that there is no universal means of measurement or of expressing thought, but that each field for enquiry has a means appropriate to itself.

So it is in the field of accountancy. Each branch has concepts and practices in common with the other, but time has shown that, in other directions, each branch must operate with doctrines and practices peculiar to its purposes, and the validity of those doctrines and practices cannot be questioned merely on the grounds of divergence. In outlook, the proprietorship accountant is essentially an historian concerned with the recording of events and not with the shaping of them. Prophecy is utterly repugnant to him and it is ingrained, not only in his doctrines and practices, but also in the code of ethics which guides the conduct of his profession. It was natural, therefore, for the accountant to transfer that traditional viewpoint to the new field in which, at first, he became an unwilling participant, and in his mind cost analysis was essentially a *post mortem*—"a writing of epitaphs on dead figures." On the other hand, the production or operating technician, grappling daily with the complex and endless problem of shaping the activities of his undertaking to the fluid conditions surrounding it, is seeking guides to immediate and future action. He is not interested in history unless it is written soon enough and has its vital implications underlined for quick

2. For diagrammatical illustration see *The Australian Accountant*, December, 1942, p. 552.

reading. Production literature of the present century is amply sprinkled with protests against the deficiencies of stale information. If accounting is to be an aid to management, its viewpoint must be aligned with that of management. The eyes of the cost accountant will therefore be turned more often to the future than to the "eternal landscape of the past."

Concepts of Cost

If its title is any guide to its function, cost accounting is concerned with "cost." The concept of cost adopted by the proprietorship accountant is actual expenditures in terms of money, and, whilst he may vary his rules for apportioning cost to accounting periods, his concept of long-run cost is absolute. The tax gatherer has a slightly different concept which the accountant must have some regard to, but he, too, thinks in terms of actual money expenditures.

The concepts of the cost accountant are conditioned by the variety of his problems. Managerial judgments may be influenced by the facts of history or by the "shape of things to come"; by the interpretation of data in isolation or in relation to external data; by the concepts of those who dispassionately value economic activity in relation to economic theory and social implications; and by the behaviour of costs under varying circumstances.

All of these various viewpoints are translated by the cost accountant into definite form by accepting a range of concepts of cost which may be classified in the following way:

(a) The concept of money expenditures on the one hand, or of economic sacrifice on the other.

(b) The concept of *actual* outgo or sacrifice; or of a notional outgo or sacrifice representative of some norm or standard.

(c) The concept of total cost, or of parts of total cost.

The concepts of partial cost may be derived from three pairs of alternatives, each taking into consideration the quality of the elements in relation to some significant circumstance, viz.:

(a) variable cost or non-variable cost;
(b) direct cost or indirect cost; and
(c) differential cost or residual cost.

Money expenditures: This concept of cost takes in the money expenditures which are the basis of ordinary accounting data, and is the concept which appeals to the traditional conservatism of the accountant as it excludes the exotic element of interest on capital. The general accountant's concept of cost may even extend to the exclusion of some money expenditures such as taxation and interest paid on borrowed money.

Economic sacrifice: This is the concept of the economist and includes rent of land, remuneration of labour, interest on capital, and the reward for enterprise. In relation to a particular undertaking, a practical approximation of the concept would be reached by the addition of interest on capital and profit to the money expenditures.

Actual outgo or sacrifice: This concept, attached to money expenditures, assumes that the values are those which have already been incurred, or will be incurred, in the production of the goods or the rendering of the service, and is the concept of the proprietorship accountant. Attached to economic sacrifice, it assumes the immediate sacrifice without notions of normality and disregards the sacrifice of the future.

Standard or Normal: This concept assumes a notional cost based on some standard of efficiency or normality, or it embodies "the shape of things to come."

Variable or Non-variable: Some elements of cost may vary in amount at a rate which is directly or prædominantly directly related to the movements in the volume of activity, whilst other elements may remain constant, or nearly constant, irrespective of changes. The purpose of the division is to provide data to exhibit the behaviour of costs under varying volumes of activity.

Direct or Indirect: In the process of tracing costs to units of activity, it is discovered that some elements can be obviously and unmistakably identified with, and traced to, particular units, and are termed Direct Costs because they are traceable by a direct method. Other elements are not so traceable and are termed Indirect Costs because they can be apportioned to units of activity only by an indirect method. The terms "direct" and "indirect" relate to the method of allocation and not to any inherent and absolute quality in the elements themselves, because an element may be a Direct Cost in relation to one unit of activity and Indirect as to another.

Differential and Residual: Changes in the volume of activity are accompanied by increase or decrease in *total* cost, as would be evidenced by a study of the variable and non-variable costs. Total Cost may be divided into two parts, however, on the basis that one part relates to a specific amount of activity which is to be added to or withdrawn from the total volume, and the resultant net increase or decrease in total cost is termed the Differential Cost and the remainder the Residual Cost. The classification may be applied in relation to any section of the total activity that may be under enquiry, and the data is important in considering questions of increasing or decreasing activity.

Combinations of these pairs of alternatives provide the opportunity for 28 varying concepts of cost.

The Utility of the Conventional Mechanism

The double-entry system of book-keeping was a remarkable invention: its utility in accounting has been amply demonstrated over a period of more than 400 years, and there is no reason to believe that obsolescence is occurring at any significant rate. Age and testing has placed upon the system an air of respectability to such an extent that it has become the indispensable tool of the accountant and has imbued in him a strong reluctance to accept any data which has not been collected and subjected to the checks of the double-entry system. So long as the same kind and amount of cost was being dealt with for both the purposes of proprietorship accounting and of cost accounting, no revolutionary act was involved in imposing the added function of classifying cost data in greater detail. The kind and amount of data, however, is not always the same and the deviations have resulted from the following:

(a) the rejection of conservatism and opportunism from the measurement of cost;

(b) the use on occasion of the concept of economic sacrifice (or of a practical approximation by including interest on capital as a cost);

(c) the ignoring of conventional accounting periods in cost distribution resulting in the under-absorption or over-absorption of costs; and,

(d) the use of standard or normal costs.

It is a tribute to the capacity and flexibility of the double-entry system that the dual purposes can be satisfied in one set of accounts by organizing the classifying media and providing the device of "cushion" accounts to take care

of the natural differences between the two sets of figures. The arrangement is most favourably demonstrated when standard costs are embodied in the general accounting system.

In essentials, double entry is a systematic method of collecting and classifying monetary transactions of a particular undertaking and may, therefore, be considered merely as a special kind of statistical method. The accountant collects and classifies other numerical facts which supplement or aid in the interpretation of the facts contained in double-entry accounts, and the kind of statistical method applied to any problem is the one that collects and presents the facts accurately and clearly. There can be no heresy, therefore, in taking a view that in some directions there is evidence of an inability on the part of the double-entry system to fulfil all the needs of cost accounting. Apart from the practical difficulties arising when the patterns of "units of activity" are numerous and complex, and when concepts of standard or normality rapidly change under dynamic conditions, the notable problem so far is that of differential and residual costs. In this problem the field of enquiry is constantly changing and the data, in many instances, of transitory value only. The problem must be dealt with by statistical methods outside of the double-entry system, otherwise a "dead-end" in mechanics will have been reached.

The Utility and Place of Cost Accounting in Peace-time Economy

Having concerned ourselves with the divergencies in outlook, concepts and mechanics inherent in each branch of accountancy, we now turn to the measurement of the utility of cost accounting in a peace-time economy, and subsequently consider the changes, if any, brought about by the impact of war.

Price is the reward that economic enterprises receive in exchange for goods or services, and whilst it may appear under many guises, such as a pecuniary figure on a tag, as tables of pecuniary figures in a mail order catalogue, or as rates, or interest, or rent, or taxes, or subscriptions, or subsidies, or as "cost plus profit," price is the nutriment of economic enterprises and a cutting off or a diminution of the supply. or a deterioration in its quality, leads to economic ill health and, may be, to the demise of the undertaking. Price, therefore, dominates the judgments of those responsible for the conduct of enterprises. The enterprise manager is interested not only with the relation of price and cost in total, as would be exhibited by proprietorship accounting, but also with the relation between the price and cost of each individual commodity or service; in other words, he wants to know if each commodity or service is capable of "standing upon its own feet." This natural curiosity, strengthened in many instances by the fear of imminent economic injury or death, was the condition which brought cost accounting into being.

Much time and attention has been devoted to the proposition that the desirable price of a commodity or service can be ascertained by making a pyramid of costs from blocks of various shapes and kinds pulled out of the total mass, and that the resultant structure is absolute in its magnitude. The accountant has pursued this line with great enthusiasm and has developed a technique in the tracing and allocating of costs which has amply demonstrated his ingenuity and industry. The refusal of the price structure to conform strictly to this mathematical picture, however, indicates either that a "dead end" in knowledge has been reached, or that the means of measurement are not appropriate to the field of enquiry. The outstanding feature of the problem is that, whilst each commodity or service may have some costs which can be identified as relating to that commodity or service and to no other, other costs which benefit it are derived from a common pool without a flow meter. Many accountants have assumed that measurement of these benefits can be effected always by a mathematical process, and in so doing merely repeat the mistake

that the mysteries of space and time can be explained in terms of the geometry of Euclid.

The prices which the consuming world is prepared to yield are influenced by a conception of cost adopted by the sellers of the commodities or services, but they also may bear the impact of a wide variety of forces which distort the structure from the shape it would take by logical mathematical analysis, those forces including demand, usage, equity, habits, and ability to pay.

It is the job of the enterprise manager to accommodate the activities of his undertaking to the surrounding conditions, and that accommodation is dominated by the necessity to engage in such activities as will ensure the success of his undertaking measured in pecuniary terms. As an adviser to management, the cost accountant becomes vitally interested in the external factors which influence price because those factors in turn influence his processes of allocating costs. The extent of that influence can be best seen by considering price policy in relation to two classes of undertaking, classified according to the degree to which they are exposed to the forces of competition for activity, viz.:

(a) the undertaking operating as a monopoly or as an approximation thereto; and,

(b) the undertaking operating in a field of unrestrained competition.

State-owned monopolies, in forms such as public utilities, have as their objectives the supply of the maximum quantity of commodities or services over long periods at the lowest possible cost, and the price structure is influenced by several factors, viz.:

(a) the necessity for the total revenue to cover the appropriate concept of cost, which usually is the commercial concept plus interest on capital provided by the State and, in some instances, the ultimate redemption of that capital;

(b) the necessity to distribute costs to the various classes of consumer of the commodities or services on an equitable basis, equity being *based* on the utility of the commodities or services to each class in relation to others and their respective abilities to pay;

(c) the necessity to promote the maximum use of the resources of the undertaking and thus cheapen the average cost of each commodity or service; and,

(d) the necessity to maintain stability of the rate structure over long periods.

The common pool of costs in these enterprises, e.g., transport services, electricity supply, is usually of large dimensions and any process of tracing and allocating total costs becomes lost in its own complexities. Some part of the total costs *can* be traced home to individual commodities or services, but the common pool of costs is distributed not by putting blocks into a pyramid but by taking blocks out, because it is the residues in each price that constitute the benefit derived from the common pool. This process may be disappointing to a "calculating prodigy" but it is the representation of reality and takes into account the economic and social purposes of the undertaking.

The relation of cost accounting to price policy in these State-owned monopolies is therefore limited to:

(a) the calculation of cost in total as it relates to various volumes of total activity;

(b) the determination of the differentials in cost involved in individual pieces of activity within the undertaking; and,

(c) the rationalisation of the price structure in line with objectives.

In the case of a privately-owned enterprise having a near monopoly of economic activity of a particular kind, the dominant motive is to extract the greatest amount of profit from the consumers of its goods or services, but if this is viewed as a long-run objective and with a recognition of the social obligations of the enterprise to the community, the price structure and purposes will be similar to those of the State-owned enterprise. The concept of cost appropriate for price fixing is commercial cost plus taxation and a reasonable return for those who have provided its capital and, possibly, some contribution to its future expansion.

In the field of unrestrained competition between enterprises the price structure is ever fluid, varying with the intensity of the competition. The individual enterprise within the field is primarily concerned with justifying its existence under the constant threat of financial injury or destruction. The prices that consumers of commodities or services will yield, or that will be accepted by competitors, may be quite unstable and unappreciative of the cost of providing the commodities or services. The individual enterprise must engage in the fight at the bargain counter and take every opportunity of holding its present activity until something better presents itself, and also add to that which it holds. In reality it is a constant process of accommodation, selecting the activity which provides the greatest financial rewards and discarding that which is unprofitable, unless it suits the strategy of competition.

You may well ask what are the functions of cost accounting in this apparently disorderly scramble. Judgment in all of these matters calls for at least two kinds of information, viz.:

(a) the desirable prices for commodities or services, i.e., the ideal price accommodating a rational concept of total cost and profit; and.
(b) the lowest limit in price cutting, i.e., the out-of-pocket cost of the commodity or service to which judgment is being directed.

One of these figures represents what will be striven for, and the other is the signal for retreat from the fight. In between these upper and lower limits the virtue of a price is measured by the extent to which it will absorb the costs contained in the common pool and thus maximise the profit, or minimise the loss, of the enterprise as a whole. Cost analysis of this kind imposes healthy restraints upon competition by making it intelligent, and thus tends to place competition upon a basis of efficiency and not of ignorance. For that reason, therefore, we have seen interest taken in cost accounting by trade associations and the acceptance by a number of industries in other parts of the world of uniform plans for cost accounting within one industry.

Thus we are clear that there is a function for cost accounting in price policy, but the decision as to whether the function is that of price fixing or of price testing depends upon the nature of the enterprise, the field of activity in which it is engaged, and the relative importance of the common pool of costs. Whatever that function may be, it will be better performed if the accountant remembers that he may have placed too much reliance on the mathematical pyramid as a representation of price, and also accepts the doctrine that equal expenditures do not always receive equal reward. The accountant needs to acquire an appreciation of the external factors which influence the pattern of prices.

Prices may be viewed from the angle that they are the indicators of efficiency and that inefficiency is indicated if costs exceed the price. Apart from the illogical factors which distort price, the opportunity of adopting a reasonable appreciation of total cost in relation to the price of a commodity or service is conditioned always by the magnitude of the common pool of costs in relation to the total costs. An individual price can have the semblance of a measure of efficiency only when it has drawn but slightly, or not at all.

on a common pool of costs, because under those conditions its content is all, or mostly, facts and not opinions. Price is usually an unsatisfactory measure.

There is, therefore, another important function of cost accounting—the measurement and comparison of efficiency in the activity by means other than price, and no limits, other than time and opportunity, are imposed on these processes. The patterns of "units of activity" are designed here not for the assembling of the cost of commodities or services to be sold, but for the purpose of isolating the cost of individual activities and coming to a conclusion as to the reasonableness of the cost and the causes underlying cost variations—the dominant note is interpretation. Comparison of costs is of no significance unless one being compared is adopted as the "measuring stick," and the usefulness of the concept of standard costs for this purpose has now been widely acknowledged. The setting of standards is necessarily the joint work of the production or operating technician and the accountant, one providing the physical specification and measurements and the other converting such into financial terms.

Measurement of efficiency has great value to the individual enterprise, whether it is struggling in the rough seas of competition or floating gracefully on the calm waters of monopoly. It may be an apparently selfish process aimed at ensuring survival or of making greater profits, but its value extends to the community at large by the promotion of stability in economic activity and the elimination of waste.

Cost Accounting and Price Control

Since we have been at war, the opportunities to use cost data to fix selling prices have, in one direction, been subjected to curtailment; but, in another direction, the opportunities have increased to an unprecedented degree. The influences are:

(a) the imposition of price control by the Government; and,
(b) the purchasing of goods and services by the Government on the basis of cost plus profit.

Control of prices became effective as from August 31, 1939, and pursued its course to a culminating point at April 12, 1943, when a "ceiling" was placed on all prices other than those for some specified commodities, including perishable primary products. Our present purpose would not be served by tracing the course of price control in detail, but in this era of price control cost accountants have had opportunities to be of assistance to industry, particularly in the directions of:

(a) applying the cost-averaging principle;
(b) applying the authorised "gross margins" to recorded costs;
(c) rationalising price structures distorted by excessive competition in pre-war times; and,
(d) preparing the cases to be presented to the Commissioner for adjustment of prices or "gross margins."

The imposition of the "ceiling" will bring in its train a series of other problems in the solution of which the processes of cost accounting will play an important part. The significant aspects of the new control appear to be that:

(a) the existing price control system will continue to operate subject to the condition that in any event the price of any commodity or service covered by the "ceiling" will not be permitted to exceed the "ceiling";
(b) commodities and services will be either "essential" or "non-essential" according to their relation to the effective prosecution of the war and the maintenance of the civil population;

(c) businesses providing essential commodities or services will be permitted to earn a reasonable amount of profit and any deficiency will be made good from public funds; but on one condition, namely, that the Government is satisfied that the operations of the individual business, or of the industry of which it is a part, are being conducted with the degree of efficiency which the exigencies of the present and prospective situation demand; and,

(d) non-essential activities will be required to rely on the promise that "God helps them who help themselves."

Efficiency appears to be the dominant note in this new control, and it is to be attained, in one direction, by the lure of subsidy, and in the other direction by the fear of economic demise. Greater economy in essential activities will be sought not only in the individual businesses but also in industries as a whole, and the processes of simplification and standardisation will be exploited to the full. In the background we may even see integration, combination, specialisation and immobilisation as ultimate aids to economy, should the situation demand.

The non-essential industries will be faced, in many instances, with falling turnovers and higher costs, resulting principally from the lower productivity of the labour left with them and from increased prices for overseas commodities. The phenomenon of fixed and variable costs is likely to loom largely in the view of the business man.

If this is to be the pattern of events, and it could hardly be otherwise if our resources are to be mobilised to fight a total war, the managers of enterprises will be making heavy demands for cost data.

Cost-plus-Profit Contracts

Following the beginnings made in 1914-1918, the present war has provided a singular opportunity to exercise the price-fixing functions of cost accounting on a large scale. The urgent necessities of the situation caused the Government to absorb a substantial part of the commercial facilities of the country, and wherever the work required was of a normal kind, or involved only normal risks, the Government has obtained its requirements through the tendering system. The value of the tendering system has been lessened for three particular reasons, viz.:

(a) competition for work was reduced, and even completely disappeared in some trades, as the volume of economic activity increased concurrently with the diversion of manpower to the armed forces and Civil Constructional Corps;

(b) much of the work required by the Government was entirely novel and the cost could not be predicted, not only because of the lack of experience in the performance but because of uncertainty in the future prices of materials and rates of wages; and

(c) the urgency for production prohibited the delays associated with the calling for, and the acceptance of, tenders.

These conditions led the Government to two types of contract, viz.:

(a) Contracts under which suppliers accepted fixed prices offered by the Government, such prices being determined by cost analysis.

(b) Contracts under which the Government accepted the full responsibility for the actual cost of the work performed and for the reasonable remuneration of the contractor for the use of his facilities and services, the basis becoming known as "cost-plus-profit." The possible need for this type of contract was in contemplation when we were merely

in danger of war and the whole problem was turned over to a panel of accountants in 1939 for examination. The formula at present used by the Government appears in a document issued by the Ministry of Munitions under the title of "Standard Conditions applicable to Contracts on a Cost plus Profit Basis," but is more popularly known as the "Yellow Peril" on account of the colour of the paper on which it is printed. It differs in some detail from the formula recommended by the original panel of accountants.[3]

The chief features of the official formula, which has lately been supplemented by detailed explanatory notes, are as under:

(a) The price to be paid for the performance of a contract is divisible into two main parts, viz:

  (i) production cost or the money expenditures unmistakably identified with, or fairly attributable to, the performance of the contract; and

  (ii) an agreed remuneration or profit for the contractor.

(b) To avoid conflict of opinion arising from varying concepts of cost, the kind of money expenditures to enter into production cost are defined.

In a field so full of knotty problems, it can scarcely be expected that a single and universal formula could reach perfection, but some reasonable criticism can be levelled at the present formula on the following grounds:

(a) the definition of the elements that constitute the concept of cost is marred by some minor but irrational restrictions and liberties;

(b) the elements that enter into the computation of profit are completely absent, the formula merely assuming that there will be agreement between the parties as to the amount; and,

(c) the basis upon which the untraceable or overhead costs are to be considered as fairly attributable to the contract is described in sparse terms.

On the whole, the inclusions and exclusions from "cost" are rational and expressed in suitable terms, but two items are open to improvement:

(a) There has been some relaxation of the original provision that cash discounts received or receivable by the contractor in respect of expenditures charged to a contract were to be credited to cost, the relaxation being to the extent that if the contractor provides the working funds for the payment of the accounts he can retain the cash discounts as separate income. The present provision leaves the door open for contractors to earn undisclosed additional profits.

(b) The formula is intended to relate solely to the production of material things but could easily be amended to provide a wider application to services as well.

The care taken to define the elements which may enter the concept of cost appears to be meticulous when it is discovered that the principal document is completely silent on the question of distributing overhead costs, and the explanatory notes are confined to some general terms and a cataloguing of some "rules of thumb." The matter is of great importance, however, because the safeguards provided by precise definitions of the elements of cost can be swept away by irrational and arbitrary apportionments of overhead cost.

So far as profit is concerned, the original recommendation of the panel of accountants provided that, in addition to Production Cost (as defined), the contractor was to receive

3. See *The Australian Accountant*, July, 1940, p. 353.

"a fair and reasonable profit, to be agreed upon by the contractor and the Commonwealth after taking into consideration:

i. the specialised knowledge required and the novelty of the work;
ii. the amount of capital expended by the contractor in fixed plant;
iii. the amount of working capital necessary for the purpose of the contract;
iv. the extent to which the normal operations of the business may be dislocated by the performance of the contract; and,
v. the extent of sub-contracting."

This comment is based on a survey of the documents, and it may be that rationality is preserved in each individual case. From our present point of view, however, we must come to the conclusion that the formula is merely a description of the kind of costs that will be considered in the assessment of the price of a contract and in no way pretends to constitute a formula by which the price may be rationally constructed. It therefore throws no fresh light on the problems of cost accounting.

Cost-plus-profit contracts have been the subject of much criticism on the ground that there is no inherent incentive to efficiency—in fact, there may be gain to the contractor by unnecessarily increasing the cost. Various means have been used to import efficiency into the performance of contracts, as, for example:

(a) the fixing of the profit as a sum of money irrespective of the amount of cost as an alternative to the assessment of the profit by a percentage of the cost;
(b) the fixing of a maximum price, adopting a reasonable conception of efficiency; and,
(c) the establishment of "target" costs based on reasonable standards of efficiency and the sharing of the savings between the contractor and the Government.

The basic problem is the absence of costs or prices to be used for comparison, and the only course open is the setting of physical standards based on measurement of performance by skilled technicians. There is no reason, therefore, why the major problems should not be dealt with by making a more extensive use of technical audit in association with financial audit.

On the credit side of "cost-plus-profit" we should not omit the indirect value that has been bestowed on the community by the spreading and intensification of cost analysis as a normal function in business activity.

The Future

By way of ending, we may draw a conclusion and attempt some prophecy. The functions of cost accounting are restricted at least by name. Accounting as an aid to management will encompass the whole of economic activity within enterprises and, therefore, cost accounting will finally merge with budgetary control to become "the highest form of accounting."

We live in a world where measurement is inextricably bound up with the way we live together, and, unless we revert to barbarism, our economic and social activities will be governed, more and more, by measurement. Cost accounting is a method of measurement and, whilst it may change its measures, there appears little doubt that its basic purposes will survive and, maybe, permeate economic activity. Perhaps the late Lord Stamp had this in mind when he prophesied that "a planned world will only be kept in order by a phenomenal development of accountancy; a half-planned world will only be kept from chaos by almost a miracle of costing and impersonal accountancy."

Correspondence

The Editor,
The Australian Accountant,
Melbourne, C.1.

THE INTERPRETER INTERPRETED

Dear Sir,

I have read the article by Mr. L. W. Irwin in the May issue of *The Australian Accountant* on "Interpretation of Percentage Statements."

Mr. Irwin's article has the singular merit of demonstrating an oft-forgotten axiom regarding statistics generally, viz., "that, being a means, not an end, their value lies in accurate interpretation."

Despite Mr. Irwin's statements, I think the common man will still insist that the rate of gross profit in the particular case given has increased by 1%, just as he would insist that his dog had died because it had eaten poisoned meat the day before, and he would be little consoled by the vet.'s sole comment, meaningless on its own, "that his favourite quadruped's decease had been occasioned by an irregular chemical condition in its anatomy." Thus we, too, in comparing gross profits, are interested in causes, and this involves relationships, which explains the introduction of the concept "rate of gross profit" as opposed to simply "gross profit."

The comparison of two successive gross profits considered as absolutes will give the increase of 7% which he suggests, but this is quite a different thing from Mr. Wiltshire's increase of 1% in the *rate* of gross profit, which is, after all, the really significant percentage. In fact, Mr. Irwin condemns his own criticism of the matter when, replying to Mr. Wiltshire's words, "this increase in Sales is accompanied by a *rise in the rate of gross profit* from 20% to 21%," he says, "I disagree that the rate of *increase in the gross profit* is equal to 1%, as inferred by the statement, but suggest the rate is much higher, i.e., 7%."

If I buy from a wholesaler £4 worth of goods and sell them for £5 in one year and the next year I buy twice the number of identical articles for £8 and sell them for £10, it is of little interest as regards profit ratio that one gross profit is 100% greater than the other, and is at best simply a rough indication of the development of my business.

Reproduced below are the figures to which the particular section of Mr. Irwin's article refers:

TABLE I

Comparison of Trading and Profit and Loss Account Figures

Item	Year ended 30/6/41			Year ended 30/6/42			Increase	
	Amount	% Sales	% Basis	Amount	% Sales	% Basis	%	Amount
SALES ..	24,500	100	100	25,000	100	102·04	2·04	500
Gross Profits	4,900	20	100	5,250	21	107·1	7·1	350

R. N. WALFORD, B.COM., A.I.C.A.

The Editor,
The Australian Accountant,
Melbourne, C.1.

INTERPRETATION OF PERCENTAGE STATEMENTS

A Matter of Proportion-Ratio a Guide

Dear Sir,

Articles in the journal, Vol. XIII, Nos. 1 and 5, contain most useful matter on the subject of interpretation.

Mr. Wiltshire's line of reasoning amplifies management's earlier method of reasoning, whereas Mr. Irwin's is certainly more scientific. Neither method is infallible (an attribute of much of accounting's methods). Let us look at the conclusions submitted by each contributor, having in mind ratio:

Mr. Wiltshire says—Sales increased by 2·04%.

Mr. Irwin agrees.

Mr. Wiltshire infers—Gross Profit increased by 1%.

Mr. Irwin says—Gross Profit increased by 7·1%.

Forget about per cent. and think of ratio. An increase of £350 in Gross Profit indicates a ratio increase of 350 in 4,900, or 3½ in 49, or approximately 7 in 100.

Mr. Irwin's attempt to clarify appears correct. (The same system of ratio can be applied throughout the Table.) However, Mr. Wiltshire establishes one basis of 100 and indicates rise or fall of items thereon over different periods, the corresponding figures for which items in respective periods vary.

Mr. Irwin's method, on the other hand, fails to recognise economic factors which would tend to change some of the items and not others. Nevertheless, his argument does seem to win the day when one considers which of the two methods of reasoning is the more accurate.

Accountants generally would do well to study carefully contents of these articles.

Yours faithfully,
L. W. CHANT, F.I.C.A., F.A.I.S.

Sydney,
June 15, 1943.

The Australian Accountant is published on the 15th of each month. Contributions correspondence, etc., intended for publication should reach the Editor not later than the 22nd day of the month preceding publication.

Contributions which are regarded as unsuitable for publication will be returned to the sender, but no responsibility can be accepted by the Editor.

Books and periodicals for review should be sent to the Editor

Correspondence must be accompanied, as a guarantee of good faith, by the name and address of the writer, not necessarily for publication.

Inquiries regarding advertisements should be addressed to the Advertising Manager.

Editorial Staff:

Editor .. .. A. A. FITZGERALD, B.COM., F.I.C.A. 361 Collins Street, Melbourne

Associate Editor .. .. I. A. L. GUNN, F.I.C.A., 8 Bond St., Sydney.

Assistant Editor and Students' Section .. .. O. R. MACDONALD, A.I.C.A., 361 Collins St., Melbourne.

N.S.W. Representative .. .. P. E. WILTSHIRE, A.I.C.A., Room 618, Australia House, 32 Carrington St., Sydney

Advertising Manager:

H. J. C. BOYD, c/o Accountants Publishing Co., Ltd., 361 Collins St., Melbourne